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SLIATE

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SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION

(Established in the Ministry of Higher Education, vide in Act No. 29 of 1995)

Higher National Diploma in Civil Engineering
Third Year, Second Semester Examination – 2016
CE3119- Measurement and Estimation

Time   : Three (03) hours
All question carry equal marks

Instruction to candidates

- This paper contains Six (06) questions and Six (06) pages including drawings (Two pages).
- Answer any Five (05) questions including question 01 (compulsory)
- BSR (08 Pages) will be provided for question 04.
- Drawings (Figure 01 and 02) are enclosed separately for first two questions (01 & 02).
- TDS measurement sheet & BOQ sheet should be prepared by the candidates.
- Standard Method of Measurement for Building works should be followed.

1.
   a. Briefly explain the Importance of SMM.   (2 Marks)
   b. Find the total center line length of the house from the given plan.   (3 Marks)
   c. Take-off quantities for the following works.
      i. Top soil removal for 3m extended area from the foundation edge   (2 Marks)
      ii. Excavation in foundation trench.   (3 Marks)
      iii. Random rubble masonry up to DPC level.   (3 Marks)
      iv. Hard earth filling under the floor of Bed room 3.   (2 Marks)
      v. Internal Plastering for Bed room 3.   (2 Marks)
      vi. Roof covering.   (3 Marks)

                                                              (Total 20 Marks)

2.
   a. Briefly explain the terms "Preliminary" & "Provisional sum"   (4 Marks)
   b. Take-off quantities for the following works based on the given drawing.
      i. Block work   (4 Marks)
      ii. Internal & External reveals.   (4 Marks)
      iii. Rafter.   (2 Marks)
      iv. Gutters.   (1 Mark)
      v. Reinforcement for lintel over D1.   (3 Marks)
      vi. Doors   (2 Marks)

                                                              (Total 20 Marks)

3.

a. Prepare a unit rate breakdown for Grade 20 (¾") concrete using standard quantities. Make any assumptions if necessary.

Cement bag (50kg) – LKR850/=, 1 cube sand – LKR12,000/=, 1 cube ¾" Metal – LKR 12,500/=, Hire of mixer 1 day – LKR 4,500/=.   (5 Marks)
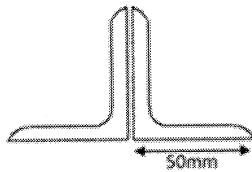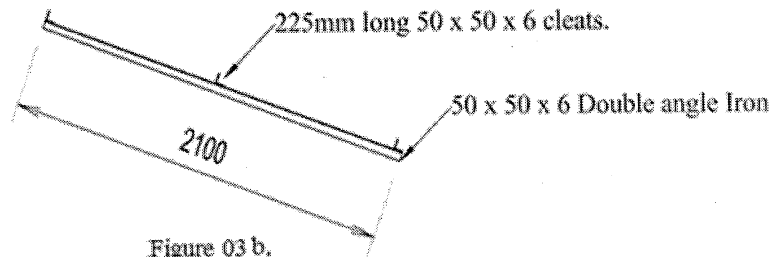

Figure 03 a.   Figure 03 b.

b. You are requested to send a cost breakdown to the consultant for a 2.1m (7 ft.) End Truss for a gable wall using 50mm x 50mm x 6mm double angle iron. Make any assumptions if necessary. Angle Iron – LKR150/ft, Tor steel rod – 18/Nos, Two coats of anti-corrosive and enamel painting – LKR 7500/Sqr   (5 Marks)

c. Describe the importance of approximate estimates.   (2 Marks)
d. Write short notes on methods of approximate estimates inclusive of advantages and disadvantages.   (8 Marks)
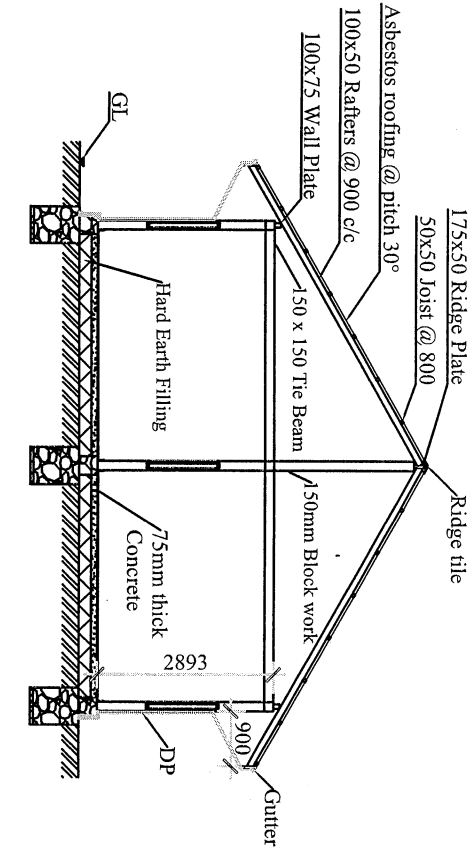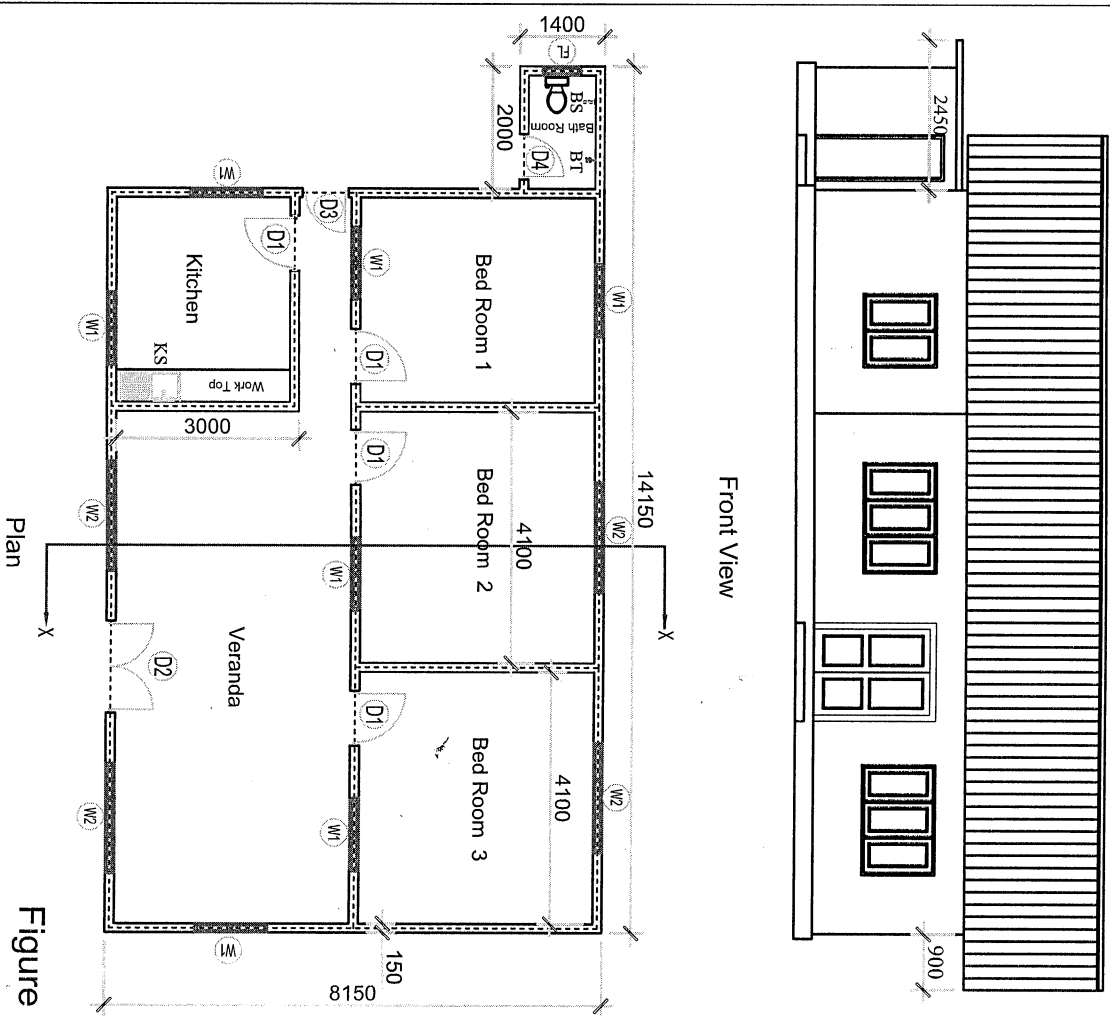
(Total 20 Marks)

4.

a. Prepare a BOQ for the following items using the given BSR. Use the Item code given in the BSR. BOQ unit should be given in S.I units. Each item caries ¾ Mark

Item No	Item	Quantity
01	Removal of trees girth size 1m	2 Nos
02	Excavation for foundation up to 750mm in ordinary soil.	23 M³
03	Hard earth filling under floor with imported earth and compaction	21 M³
04	2" Grade 15 Screed concrete	24 M²
05	Random Rubble masonry in foundation	21.5 M³
06	Grade 20 (20) 75mm thick Floor concreting	9 Sqr
07	Porcelain Homogenous 300 x 300mm MATT floor tile	71 M²
08	Tile Skirting	32 M
09	Gypsum board suspended ceiling	68.2 M²
10	6" solid Block masonry	140 M²
11	Powder Coated Aluminium swing single door	9 M²
12	Powder Coated Aluminium casement window	17.3 M²
13	Hip roof timber frame work for Calicut pattern tile for single storey building	138 M²
14	Calicut pattern tile roof covering	158 M²
15	15mm 1:5 cement: sand plastering for external wall	75 M²
16	15mm smooth plastering for internal wall	205 M²
17	Internal wall painting two coats	205 M²
17	External wall painting two coats	75 M²
19	Grade 20 Concreting for lintels and Tie beam	8.9 Cube
20	Steel reinforcement for slab, beam & lintels	305 Kg

b. Briefly explain the preamble and steps to be followed in preparation of a BOQ. (5 Marks)
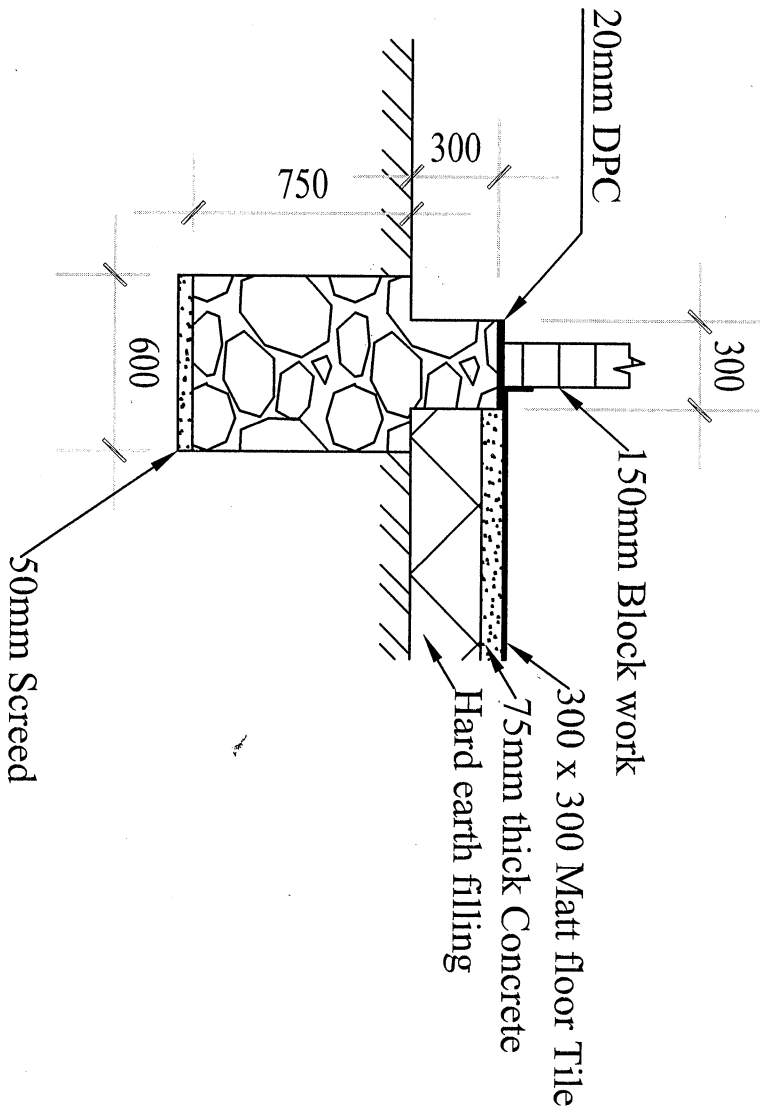
(Total 20 Marks)

5.

    a. State the methods of tendering and types of contracts. (3 Marks)

    b. Name any 6 components of a contract document. (3 Marks)

    c. Discuss the design and build contract and traditional procurement including advantages, disadvantages and procedure. (6 Marks)

    d. Under which circumstances, bid security may be forfeited? (3 Marks)

    e. Name the Securities stated in the bidding document and their purposes. (2 Marks)

    f. Briefly explain the deduction and repayment of retention money (3 Marks)

(Total 20 Marks)

6.

    a. What are the dispute resolution methods in practice? (3 Marks)

    b. Write short notes on:

        i. Adjudication & Appointment of an adjudicator based on the ICTAD/CIDA publications (3 Marks)

        ii. Employers & Contractors obligations (4 Marks)

        iii. Variation and claim (2 Marks)

    c. Discuss the terms "default by the contractor", "default by the employer" and "Termination of a contract" (6 Marks)

    d. Compare the litigation and Alternate Dispute Resolution (ADR). (2 Marks)

(Total 20 Marks)

Front View

Plan

Figure 01

Section x-x

Labels (Section x-x):
- 175x50 Ridge Plate
- 50x50 Joist @ 800
- Asbestos roofing @ pitch 30°
- 100x50 Rafters @ 900 c/c
- 100x75 Wall Plate
- Ridge tile
- 150 x 150 Tie Beam
- 150mm Block work
- GL
- Hard Earth Filling
- 75mm thick Concrete
- 2893
- DP
- 900
- Gutter

Plan labels: Kitchen, KS, Work Top, Bed Room 1, Bed Room 2, Bed Room 3, Veranda, Bath Room, BS, BT, Dimensions: 1400, 2000, 3000, 4100, 4100, 14150, 8150, 150, 900, 2450

SCHEDULE OF DOORS & WINDOWS

TYPE	SIZE	DESCRIPTIONS	NoS.
D1	900 × 2100	Paneled Door with 100 x 75 Frame	04
D2	1500 × 2000	-Ditto-	01
D3	750 × 2100	-Ditto-	01
D4	750 × 2100	PVC Door 75 x 50 Frame	01
FL	625 × 450	AL FRAMED GLAZED FANLIGHT with 40 x 25 Frame	01
W1	1200 × 1200	Paneled window with 100 x 75 Frame	07
W2	1800 × 1200	-Ditto-	04

Figure 02

20mm DPC

300

750

300

600

150mm Block work

300 x 300 Matt floor Tile

75mm thick Concrete

Hard earth filling

50mm Screed

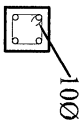GENERAL NOTES:

01. All dimensions are given in millimeter.
02. All drawings are not to be scaled.
03. Grade of concrete are as follows.

Screed Concrete — Grade 15
Ground Floor Concrete — Grade 20
Tie beam,Bathroom slab, work top- Grade 20

04. Reinforcement details are as follows.
a. Tie Beam, Lintel cover —25mm
b. Tie Beam r/f - 4T10, R6@8mm
c. Kitchen work Top & Bathroom Slab
- T10 Bars @150mm c/c Both ways
d. Lintels bearing on the wall 300mm both sides
(Door/Window size + 600mm)

1Ø

Tie Beam, Lintel

ABBREVIATIONS
BS - BIDET SHOWER
BT - BIB TAP
SH - SHOWER
DP - DOWN PIPE
KS -.KITCHEN SINK